(12) UK Patent Application (19) GB (11) 2 107 164 A

(21) Application No 8130544
(22) Date of filing 9 Oct 1981
(43) Application published
27 Apr 1983
(51) INT CL³
A01M 23/38
(52) Domestic classification
A1M DD
(56) Documents cited
GBA 2023398
GB 1513190
GB 1301130
GB 0594894
GB 0522580
GB 0426499
GB 0398287
GB 0395961
GB 0283632
GB 0226736
(58) Field of search
A1M
(71) Applicant
Martin Trevor Maxwell Baldwin,
c/o Ingersoll Rand,
Sonacome CCA, BP 24
Ain Smara, Constantine,
Algeria
(72) Inventor
Martin Trevor Maxwell Baldwin
(74) Agents
J. Miller and Co.,
Lincoln House, 296—302
High Holborn, London
WC1V 7JH

(54) **Vermin trap**

(57) A vermin trap comprising a housing within which two electrical contacts (4*a*, 5*a*, 4*b*, 5*b*) are located, the housing being so shaped that a vermin must bridge the contacts (4*a*, 5*a*, 4*b*, 5*b*) in an attempt to reach a lure, and circuit means (7, 8, 9, 11, 12, 13, 14) arranged to produce a relatively high alternating potential from a direct current source (15) of relatively low output potential and to apply the said alternating potential between the contacts (7, 8, 9, 11, 12, 13, 14).

FIG. 3

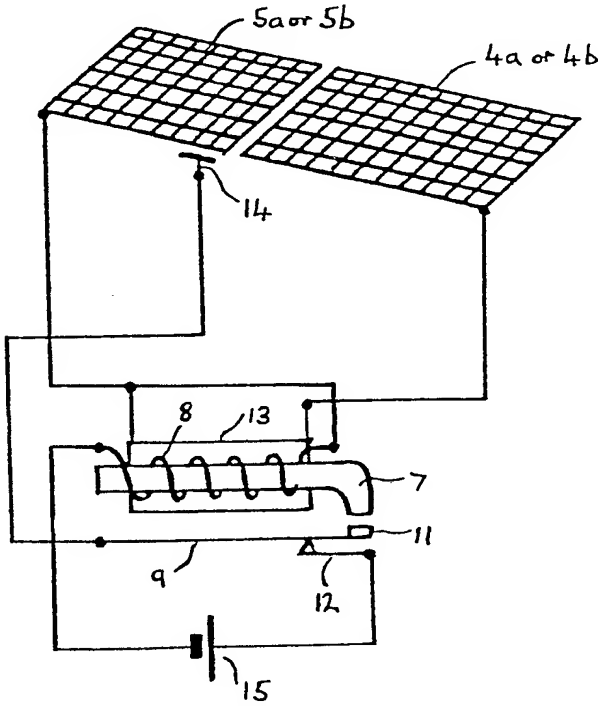

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FIG. 1

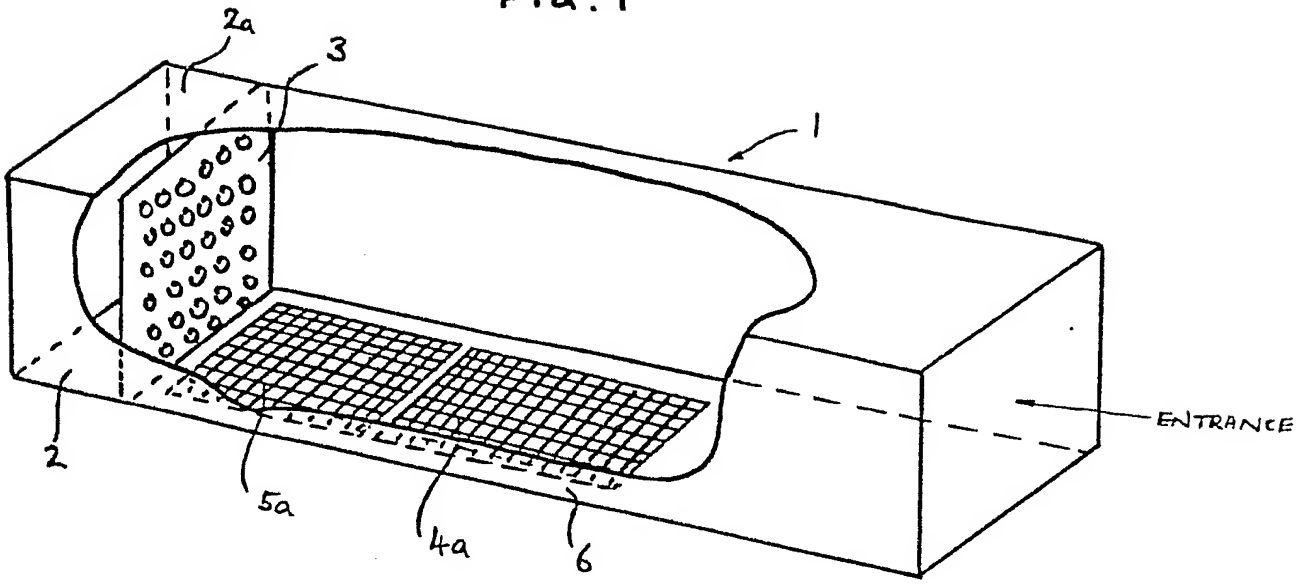


FIG. 2

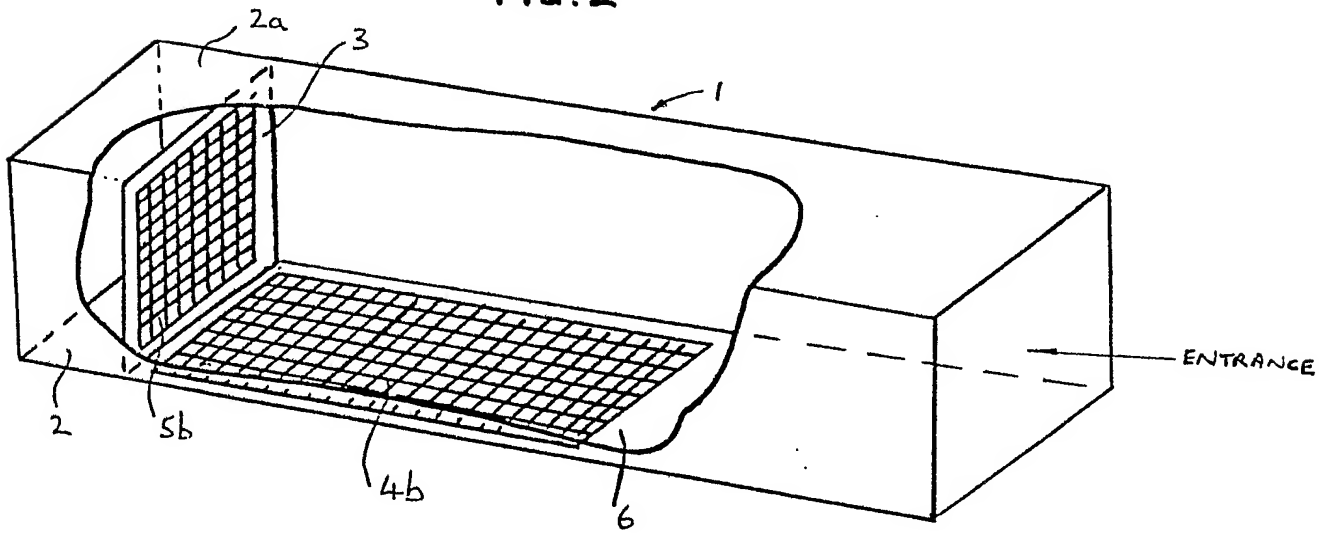


FIG. 3

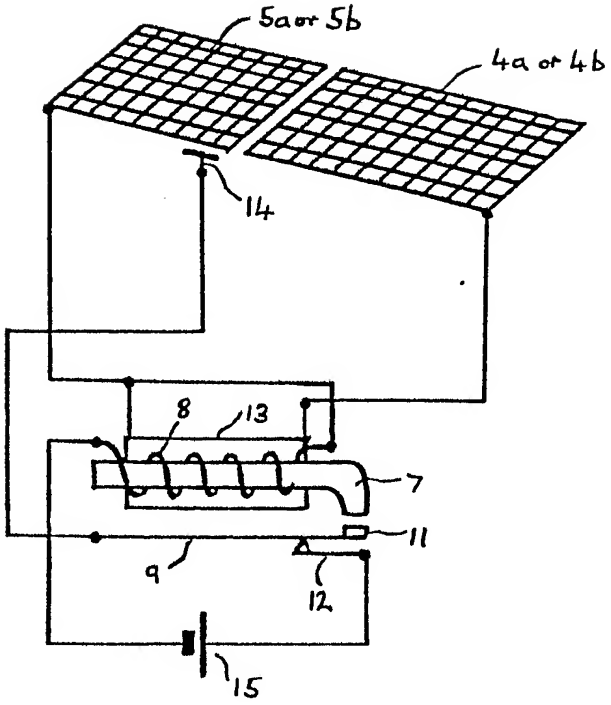
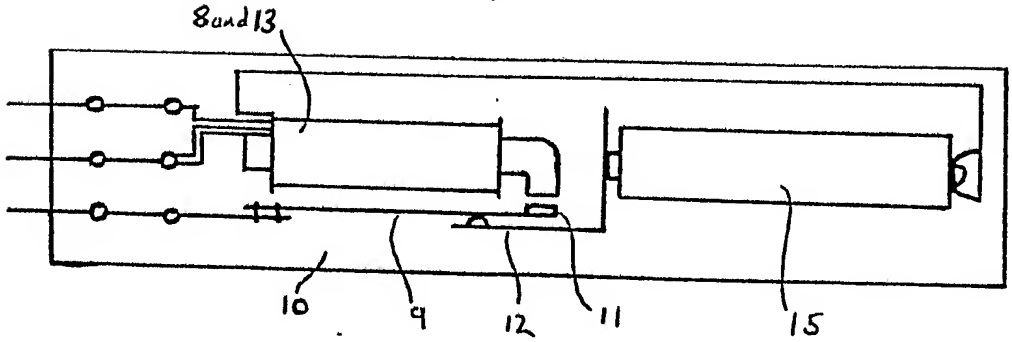


FIG. 4



SPECIFICATION

Vermin trap

The present invention relates to vermin traps and more particularly, but not so restricted, to traps suitable for catching mice.

Known ways of catching vermin, particularly mice, suffer from a number of disadvantages. Traps which physically strike the vermin are unpleasant to use as they tend to mutilate the vermin and this results in the need to dispose of a blood-stained carcase.

The present invention provides a vermin trap comprising two electrical contacts and circuit means arranged to produce a relatively high electrical potential from a direct current power source having a relatively low output potential, and to apply the said relatively high potential between the two contacts, the arrangement being such that a vermin touching the two contacts is given an electric shock.

Preferably each of the contacts comprises a sheet or layer of metal.

The two contacts may be adjacent to each other and positioned on a floor member of the trap.

One contact may comprise a mesh.

One contact may be perforated and form at least part of a wall of a bait compartment.

Preferably switch means are provided which are arranged to actuate the circuit means when a vermin is in the trap. The switch means may be arranged to be switched when a vermin touches one of the two contacts. The said one of the two contacts may form part of the switch means.

A delay means may be provided which is arranged to deactuate the circuit means a predetermined time after the circuit means has been actuated.

Preferably the circuit means includes a make-and-break circuit for converting direct current to alternating current and transformer means for increasing the voltage of the alternating current. A magnetisable core which forms part of the make-and-break circuit may also form at least part of the transformer means.

Preferably there are two windings on the core, one winding constituting both part of the make-and-break circuit and the primary winding of the transformer means, and the other winding constituting the secondary winding of the transformer.

The circuit means may be connected to a power source which comprises an electrical cell.

The circuit means may be connected to a power source which comprises an alternating current-direct current converter.

The said relatively high potential may be in the range 20—5000 volts, and preferably in the range 50—1000 volts.

Preferably the trap includes a compartment which houses the two contacts, the compartment being such that a human hand cannot simultaneously touch both contacts.

A vermin trap according to the present invention catches vermin, for instance mice, by giving them an electric shock. Although the present invention is not restricted to the theory, it is believed that the shock required to kill a mouse is not particularly large since mice tend to die easily from fright. It is through that a mild electric shock is sufficient to give a mouse a heart attack and thus kill it. A mouse killed in such a trap is not mutilated and thus the task of disposing of the dead mouse is not so unpleasant.

The present invention will be illustrated, merely by way of example, with reference to the accompanying drawings, in which:

Figure 1 shows a cut-away perspective view of part of a first embodiment of a vermin trap according to the present invention;

Figure 2 shows a cut-away perspective view of part of a second embodiment of a vermin trap according to the present invention;

Figure 3 shows a schematic diagram of a circuit suitable for a vermin trap according to the present invention; and

Figure 4 shows a diagram which indicates one way in which the components of a circuit such as that shown in Figure 3 may be housed in a unit suitable for incorporating into traps such as those shown in Figures 1 and 2.

The Figures and the invention will now be explained by describing a vermin trap suitable for catching mice.

Figure 1 shows part of a first embodiment of a mouse trap according to the present invention. The trap consists of a square-sectioned tube 1, one end of which is open and forms the entrance of the trap, and at the other end of which is a bait compartment 2. The bait compartment 2 has a lid 2*a* to provide access to the compartment and is separated from the tube 1 by a perforated wall 3. Two electrical contacts in the form of metallic meshes 4*a* and 5*a* are positioned on the floor 6 of the tube 1 adjacent to one another so that a mouse in the trap treads on both meshes 4*a* and 5*a* as it is attracted by bait in the bait compartment. The two meshes 4*a* and 5*a* are connected to a circuit which applies a relatively high electric potential, e.g. in the range 50—1000 volts, therebetween. A mouse standing on the meshes 4*a* and 5*a*, for instance with its front feet on the mesh 5*a* nearest the bait compartment 2 and its back feet on the other mesh 4*a*, is thus given an electric shock which gives it a heart attack and kills it. The circuit for applying the potential between the meshes 4*a* and 5*a* will be described below.

Figure 2 shows a second embodiment of a mouse trap according to the present invention. This embodiment is similar to that shown in Figure 1 and like parts are given like reference numerals. In this embodiment, the two electrical contacts are provided as a first metallic mesh 4*b* which is positioned on the floor 6 of the tube 1, and a second metallic mesh 5*b*, which may be a perforated plate, and which forms part of the wall 3 separating the bait compartment 2 from the tube 1. As in the embodiment described above,

the meshes 4*b* and 5*b* are connected to a circuit which applies a relatively high potential therebetween. In this embodiment, a mouse in the trap is likely to contact the mesh 4*b* with its feet and the mesh 5*b* with its mouth or nose as it tries to reach the bait in the bait compartment 2, and hence receives an electric shock.

Figures 3 and 4 show a circuit suitable for applying a relatively high potential between the electrical contacts 4*a* and 5*a*, or 4*b* and 5*b*. The circuit essentially comprises a make-and-break circuit and a transformer.

The make-and-break circuit consists of a magnetisable core 7, such as a piece of soft iron, around which is a winding 8. Adjacent the core 7 is a flexible and resilient strip 9, for instance a strip of copper. One end of the strip 9 is fixed to a base 10 and the other end, which carries a piece of soft iron 11, is free to move. The strip 9 is positioned between the core 7 and a contact point 12 which is also mounted on the base 10. The strip 9 is biased by its own resilience towards and into electrical contact with the contact point 12. When current passes through the winding 8, the core 7 is magnetised and the piece of soft iron 11 is attracted towards the core 7 so that the free end of the strip 9 moves away from the contact point 12 and the electrical contact between the strip 9 and the contact point 12 is broken. The circuit is arranged so that the strip 9 and the contact point 12 together form a switch which connects the winding 8 to an electric cell 15. Thus, when the electrical contact between the strip 9 and the contact point 12 is broken, as described above, the winding 8 is disconnected from the electric cell 15. The core then loses its magnetisation, and no longer attracts the piece of soft iron 11, and the strip 9 moves, by means of its resilience, back into contact with the contact point 12. This cycle is then repeated until the electric cell 15 either runs down or is disconnected from the circuit. As contact is repeatedly made and broken between the strip 9 and the contact point 12, the current in the winding 8 during this cycle is repeatedly switched on and off. Thus, the current in the winding 8 may be viewed as an alternating current. It will be appreciated that the principles of this type of make-and-break circuit are well-known and are commonly used in bells which produce a continuous ringing sound.

The transformer shown in the circuit in Figures 3 and 4 consists of a magnetisable core, a primary winding, and a secondary winding. The core and primary winding are formed by the core 7 and the winding 8 described above, and the secondary winding is formed by a winding 13 (represented by a box in Figure 3) which is also wound on the magnetisable core 7. The secondary winding 13 has many more turns than the winding 8. Alternating current produced in winding 8 as a result of the operation of the make-and-break circuit described above, will thus induce an alternating current in the secondary winding 13. The induced current in the winding 13 will, of course, be of much higher voltage and a much lower amperage than that in the winding 8. The output of the secondary winding 13 is thus an alternating current of relatively high potential whereas the circuit is powered by a direct current of relatively low potential. This features enables the trap to be operated by a power source, such as a small electric cell, having a relatively low power output. As Figure 3 shows, the circuit is arranged so that the output of the secondary winding 13 is applied between the two electrical contacts 4*a* and 5*a*, or 4*b* and 5*b*, so that a mouse in contact therewith is given a shock.

The relatively high potential may be continuously applied between the contacts but in order to save power a switch may be provided to actuate the circuit described above when a mouse enters the trap. One such switch is shown schematically in Figure 3. The mesh 5*a* acts as one contact of a switch and is held spaced apart from a second contact 14 by means of two small foam pads (not shown) between the mesh 5*a* and the floor 6 of the tube 1. When a mouse stands on mesh 5*a*, the foam pads are compressed and the mesh 5*a* moves into contact with the second contact 14. A similar type of switch may be provided in the embodiment shown in Figure 2 and preferably the switch will be closed when the mesh 5*b* is either pushed towards the bait compartment or pulled away from the compartment.

As an alternative to the switching means described above, a micro-switch may be used which is activated when one of the electrical contacts is moved. As the man skilled in the art will appreciate, it is possible to provide other switch means in the trap which detect the presence of a mouse, for instance, photoelectric detectors, pressure transducers, etc.

If some kind of switch is used in a trap then it is also possible to provide a delay device which will disconnect the electric cell 15 from the circuit a predetermined time after the circuit has been actuated. The predetermined time should, of course, be long enough to ensure that the mouse in the trap is killed from the shock it receives, but short enough to avoid undue power consumption. Suitable delay devices are considered to be well-known to those skilled in the art.

The mouse-trap has so far been described as having two meshes, or perforated sheets, which the mouse contacts. Such meshes have the advantage that when a mouse is standing thereon and receives a shock its feet will involuntarily grip the mesh and the mouse will be immobilised. Thus, the mouse will receive a prolonged electric shock which will ensure that it is killed. It is not necessary, however, to use meshes. Plane sheets of metal, for instance of stainless steel or aluminium, may also be used. Alternatively, the meshes may be replaced by metallic films which have been deposited on the floor 6 or the wall 3.

As Figures 3 and 4 show, a mouse-trap according to the present invention can be powered by a simple 1.5 volt cell. Additional cells can, of course, be used and it is also possible to

connect the device to an alternating current—direct current converter which converts mains supply alternating current to direct current suitable for driving the make-and-break circuit. Such converters are, of course, well-known and are often used to power portable electronic calculators from a mains supply.

The potential applied to the two meshes 4*a* and 5*a*, or 4*b* and 5*b*, can, of course, be varied by adjusting the voltage of the power source and the number of turns in the winding 8 or the secondary winding 13, but using a 1.5 volt cell as the power source it would be difficult to obtain a shock from the two contacts which would seriously hurt a healthy human being. In addition to this safety feature, the mouse-trap can be designed so that the meshes 4*a* and 5*a*, or 4*b* and 5*b*, are several centimetres away from the entrance to the tube 1 so that human fingers reaching into the tube 1 through the said entrance cannot simultaneously touch both electrical contacts.

It has been found that the relatively high potential applied between the two contacts may preferably be around 120 volts and if a 1.5 volt cell is used this can be achieved if the winding 8 has around 50 turns and the secondary winding has around 4000 turns.

When a mouse is caught in the trap it is relatively simple to dispose of as it can simply be shaken out into a disposal bag or rubbish bin. It would not normally, therefore, be necessary to handle the mouse. A bulb or some other kind of indication system may be used to indicate when a mouse has been caught although some indication is usually given by the make-and-break circuit which tends to produce a buzzing sound when it is actuated.

A variety of bait can be used in the bait compartment 2, for instance cheese or bacon rind. Alternatively, a synthetic mouse attractant, such as those commonly used in mouse poisons, may be employed and this avoids the need to frequently change the bait.

The mouse-trap may be made out of a variety of materials but in a preferred form the tube 1 and the base 10 may be plastics pressings. It will also be apparent that the trap described above could be adapted so as to be suitable for killing rats or other vermin.

The mouse-trap described above is easily portable and may be adapted to run off a small 1.5 volt cell. It is thus convenient, safe, and relatively inexpensive to use.

CLAIMS

1. A vermin trap comprising two electrical contacts and circuit means arranged to produce a relatively high electrical potential from a direct current power source having a relatively low output potential, and to apply the said relatively high potential between the two contacts, the arrangement being such that a vermin touching the two contacts is given an electric shock.

2. A vermin trap as claimed in claim 1 in which each of the contacts comprises a sheet or layer of metal.

3. A vermin trap as claimed in claim 2 in which the two contacts are adjacent to each other and positioned on a floor member of the trap.

4. A vermin trap as claimed in claim 3 in which one contact comprises a mesh.

5. A vermin trap as claimed in any of claims 2, 3, or 4 in which one contact is perforated and forms at least part of a wall of a bait compartment.

6. A vermin trap as claimed in any preceding claim comprising switch means which is arranged to actuate the circuit means when a vermin is in the trap.

7. A vermin trap as claimed in claim 6 in which the switch means is arranged to be switched when a vermin touches one of the two contacts.

8. A vermin trap as claimed in claim 7 in which the said one of the two contacts forms part of the switch means.

9. A vermin trap as claimed in any of claims 6 to 8 which includes delay means which is arranged to de-actuate the circuit means a predetermined time after the circuit means has been actuated.

10. A vermin trap as claimed in any preceding claim in which the circuit means includes a make-and-break circuit for converting direct current to alternating current and transformer means for increasing the voltage of the alternating current.

11. A vermin trap as claimed in claim 10 in which a magnetisable core which forms part of the make-and-break circuit also forms at least part of the transformer means.

12. A vermin trap as claimed in claim 11 in which there are two windings on the core, one winding constituting both part of the make-and-break circuit and the primary winding of the transformer means, and the other winding constituting the secondary winding of the transformer.

13. A vermin trap as claimed in any preceding claim in which the circuit means is connected to a power source which comprises an electrical cell.

14. A vermin trap as claimed in any of claims 1 to 12 in which the circuit means is connected to a power source which comprises an alternating current—direct current converter.

15. A vermin trap as claimed in any preceding claim in which the said relatively high potential is in the range 20—5000 volts.

16. A vermin trap as claimed in any preceding claim which includes a compartment which houses the two contacts, the compartment being such that a human hand cannot simultaneously touch both contacts.

17. A vermin trap substantially as herein described with reference to and as shown in the accompanying drawings.

New claims or amendments to claims filed on 18.8.82.

Superseded claims 1, 3, 5, 16.

New or amended claims:— 1, 3, 5, 16 and 18.

1. A vermin trap comprising a housing within which two electrical contacts are located, the housing being so shaped that a vermin must bridge the said contacts in an attempt to reach a lure, and circuit means arranged to produce a relatively high alternating potential from a direct current source of relatively low output potential and to apply the said alternating potential between the said contacts.

3. A vermin trap as claimed in claim 2 in which the two contacts are adjacent to each other and positioned on a floor member of the housing.

5. A vermin trap as claimed in any of claims 2, 3 or 4 in which one contact is perforated and forms at least part of a wall of a compartment provided for containing a lure.

16. A vermin trap as claimed in any preceding claim in which the housing is so configured that a human hand cannot simultaneously touch both contacts.

18. The combination of a vermin trap as claimed in any preceding claim and a lure.

Printed for Her Majesty's Stationery Office by the Courier Press, Leamington Spa, 1983. Published by the Patent Office 25 Southampton Buildings, London, WC2A 1AY, from which copies may be obtained.

PUB-NO: GB002107164A

DOCUMENT-IDENTIFIER: GB 2107164 A

TITLE: Vermin trap

PUBN-DATE: April 27, 1983

INVENTOR-INFORMATION:

NAME	COUNTRY
BALDWIN, MARTIN TREVOR MAXWELL	N/A

ASSIGNEE-INFORMATION:

NAME	COUNTRY
BALDWIN MARTIN TREVOR MAXWELL	N/A

APPL-NO: GB08130544

APPL-DATE: October 9, 1981

PRIORITY-DATA: GB08130544A (October 9, 1981)

INT-CL (IPC): A01M023/38

EUR-CL (EPC): A01M023/38

US-CL-CURRENT: 43/98

ABSTRACT:

A vermin trap comprising a housing within which two electrical contacts (4a, 5a, 4b, 5b) are located, the housing being so shaped that a vermin

must bridge the contacts (4a, 5a, 4b, 5b) in an attempt to reach a lure, and circuit means (7, 8, 9, 11, 12, 13, 14) arranged to produce a relatively high alternating potential from a direct current source (15) of relatively low output potential and to apply the said alternating potential between the contacts (7, 8, 9, 11, 12 13, 14). □